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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,725	03/31/2004	David D. Peters	12064	5132
28484	7590	11/17/2004		
BASF CORPORATION LEGAL DEPARTMENT 1609 BIDDLE AVENUE WYANDOTTE, MI 48192			EXAMINER BOYKIN, TERRESSA M	
			ART UNIT	PAPER NUMBER
			1711	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/813,725

Applicant(s)

PETERS ET AL.

Examiner

Terressa M. Boykin

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3-31-04
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-24 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5489366 see abstract, col. 4 line 25 through col. 7 lines 65 and examples; or US 5352807 see abstract, col. 3 lines 35 through 60 and example 1.**

**US 5489366** discloses a distillation method for the purification of crude propylene oxide containing contaminating quantities of water and methanol by partially purifying the crude propylene oxide in a plural stage distillation zone to provide a vaporized overhead distillate propylene oxide fraction containing a minor contaminating amount of vaporized water, and passing the propylene oxide vapor fraction through a drying chamber containing a porous hygroscopic solid absorbent to selectively absorb water vapor onto the absorbent, and liquefying and recovering the thus-dehydrated purified propylene oxide.

This invention relates to the purification of crude propylene oxide. More particularly, the reference relates to a distillation process for removing contaminating quantities of methanol, acetone, and water from a crude propylene oxide feedstock. Still more particularly this invention relates to a method wherein a crude propylene oxide feedstock contaminated with from about 50 to about 1000 ppm of methanol, from about 0 to 1 wt. % of acetone and about 0.4 to about 4 wt. % of water is partially purified in a distillation zone comprising a plurality of distillation columns to obtain a vaporized

Art Unit: 1711

overhead propylene oxide distillate fraction consisting essentially of propylene oxide and about 0.04 to about 0.8 wt. % of water wherein the vaporized distillate fraction is passed through a drying chamber containing a porous hygroscopic solid absorbent to selectively absorb water vapor onto the absorbent, and wherein the thus-dehydrated purified propylene oxide is liquefied and recovered.

In accordance with the reference, the purification of crude propylene oxide containing contaminating quantities of water, acetaldehyde and methanol and other impurities is accomplished in a plural stage distillation zone to provide a final vaporized overhead distillate propylene oxide fraction consisting essentially of propylene oxide and a minor contaminating amount of vaporized water; the propylene oxide vapor fraction being passed through a drying chamber containing a porous hygroscopic solid absorbent to selectively absorb water vapor onto the absorbent, and the thus-dehydrated purified propylene oxide then being liquefied and recovered.

The drawings disclosed therein represent a schematic flow sheet with conventional parts omitted showing the general recovery sequence that is used in accordance with the present invention in purifying propylene oxide. See also applicants' claims 1, 2, 5, 7, 10, 15, 16, 17.

The steps of purifying comprise:

In a distillation method for the purification of crude propylene oxide containing contaminating quantities of water, acetaldehyde and methanol wherein the crude propylene oxide is partially purified in a plural stage distillation zone to provide a vaporized overhead distillate propylene oxide fraction consisting essentially of propylene oxide and not more than about 0.2 wt. % of vaporized water, the improvement which comprises the step of: passing said propylene oxide vapor fraction through a drying chamber containing a porous hygroscopic solid absorbent at a temperature of about 34 to about 100 C. and a pressure of about 15 to about 30 psia, to selectively absorb water vapor onto the absorbent, and liquefying and recovering the thus-dehydrated purified propylene oxide.

**US 5352807** discloses a method of purifying propylene oxide prepared by reaction of an organic hydroperoxide with propylene and containing less than 0.05 ppm by weight

Art Unit: 1711

of poly (propylene oxide) having a molecular weight of at least 50,000 and containing contaminating amounts of one or more of methyl formate, acetaldehyde, propionaldehyde and C<sub>4</sub>-C<sub>7</sub> hydrocarbon impurities which comprises contacting a liquid mixture of said propylene oxide and impurity with a solid activated carbon absorbent and separating propylene oxide having a reduced impurity content from the absorbent.

With regard to claim 2, note that the reference specifically, discloses a method for the separating close-boiling impurities from propylene oxide essentially free of high molecular weight poly (propylene oxide) which comprises contacting the impure propylene oxide with solid activated carbon adsorbent and separating propylene oxide reduced in impurities content from the adsorbent.

With regard to claims 3, 4, 5, 6, 8, 9, 11-14, 18, 19 and 20 the adsorption is preferably carried out by passing the impure propylene oxide through a bed of granular activated carbon. Alternatively, powdered activated carbon can be slurred in the impure propylene oxide and separated by filtration. Specifically, an impure propylene oxide fraction, or crude propylene oxide, contaminated with impurities including methyl formate, acetaldehyde, propionaldehyde, acetone, methanol and water is charged by a charge line 10 to a first distillation column 100 which is operated so as to remove methyl formate, acetaldehyde and C<sub>5</sub> hydrocarbons as an overhead distillate fraction by way of a discharge line 102. In accordance with this embodiment, the first distillation column 100 will suitably contain about 10 to 60 theoretical plates and is operated at a pressure of about 10 to about 70 psig with a reboiler temperature of about 50 C to about 90 C and a top reflux temperature of about 40 to about 80 C., the distillation conditions being selected so as to obtain substantially complete removal of the C<sub>5</sub> hydrocarbons and partial removal of acetaldehyde and methyl formate impurities overhead by way of a line 102.

Note that the reference discloses that the purified polyether polyol as follows:

Art Unit: 1711

A 3/4" ID and 8"-long column packed with 40 grams of solid adsorbent activated carbon (Calgon F 400) was used in a series of adsorption experiments for impurities removal from crude propylene oxide. A crude propylene oxide stream essentially free of poly (propylene oxide) having at least 50,000 molecular weight, i.e. less than 0.05 ppm by weight, and containing as impurities 480 ppm by weight acetaldehyde, 0.3 wt. % methanol, 775 ppm by weight methyl formate, 775 ppm by weight propionaldehyde, 0.41 wt. % acetone, and 450 ppm by weight C.sub.6 hydrocarbons including 300 ppm 2-methyl pentane, 2-methyl-2-pentene and 2-methyl-1-pentene was fed into the top of the column at 100 cc/hr. The column was maintained at ambient temperature (25.degree. C.) and pressure (1 atmosphere). The effluent from the bottom of the column was collected and sampled for GC analysis.

After 5 hours of operation, the accumulative effluent with a total volume of about 500 cc contained non-detectable (5 ppm or less) amounts of acetaldehyde, methyl formate, propionaldehyde, C.sub.6 hydrocarbons, about 0.24 wt. % methanol and about 0.38 wt. % acetone. The concentration breakthrough for acetone occurred at about 26 minutes, for methanol at about 50 minutes, for acetaldehyde at about 4.1 hours, for methyl formate at about 5 hours, for propionaldehyde at about 6 hours and for C.sub.6 hydrocarbons at about 8 hours.

Thus, the references discloses a method of purifying polyether polyols of non-volatile impurities prepared from the same components as claimed by applicants. Thus in view of the above, there appears to be no significant difference between the reference(s) and that which is claimed by applicant(s). Any differences not specifically mentioned appear to be conventional. Consequently, the claimed invention cannot be deemed as novel and accordingly is unpatentable.

### Correspondence

Please note that the cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants may be referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Terressa Boykin whose telephone number is 571 272-1069. The examiner can normally be reached on Monday through Friday from 6:30am to 3:00pm.

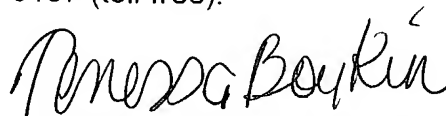
Art Unit: 1711

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. The general information number for listings of personnel is ( 571-272-1700).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tmb



**Examiner Terressa Boykin**  
**Primary Examiner**  
**Art Unit 1711**